

Transportation System Overview

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Presentation Overview

- Transportation objectives/drivers
- Assumptions
- Transportation system overview
- Operating scenarios
- Standardized Canister
- MCO
- Issues

Transportation Objectives

- Provide a transportation cask system to RW per the EM/RW Memorandum of Agreement (January 1999)
- Provide EM support for a transportation system per the EM/RW Action Memorandum (July 2001)

Transportation Drivers

- NWPA requires transportation of SNF in NRC-certified containers
- Federal Transportation Requirements:
49 CFR 173 - General Requirements for Shipments and Packaging, 10 CFR 71 - Packaging and Transportation of Radioactive Materials

Transportation Drivers (continued)

- Memorandum of Agreement (MOA) for Acceptance of Department of Energy Spent Nuclear Fuel and High-Level Radioactive Waste between the Assistant Secretary for Environmental Management and the Director of the Office of Civilian Radioactive Waste Management, Rev. 1, January 1999
- Action Memorandum to Approve Transfer of Responsibility for the Design, NRC Certification, and Fabrication of the Transportation Cask System, July 2001

Transportation System Assumptions

- Repository will open in June 2010
- Commercial and HLW shipments begin in June 2010
- EM SNF shipments will begin in 2010
- EM SNF and HLW will be co-disposed

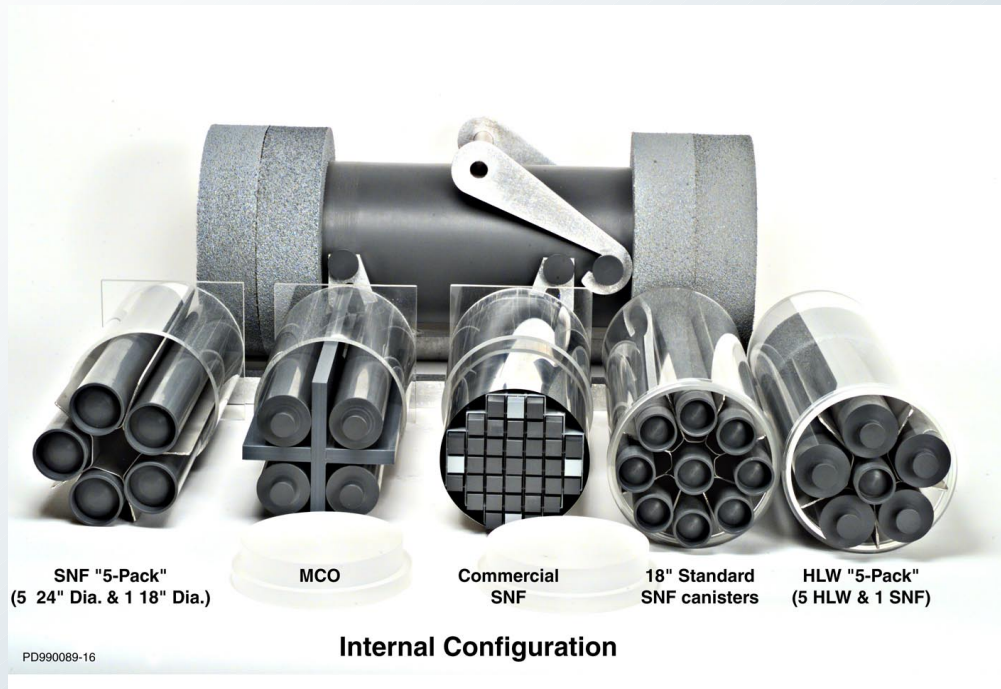
Transportation Strategy

- Develop system concept (complete)
- Build consensus with customers (continuing)
- Develop performance specification (complete)
- Issue CBD request for Expressions of Interest (complete)
- Provide EM interface requirements to RW Transportation effort (TWG initiated)
- Provide technical assistance to RW during procurement process

Transportation Concept Development

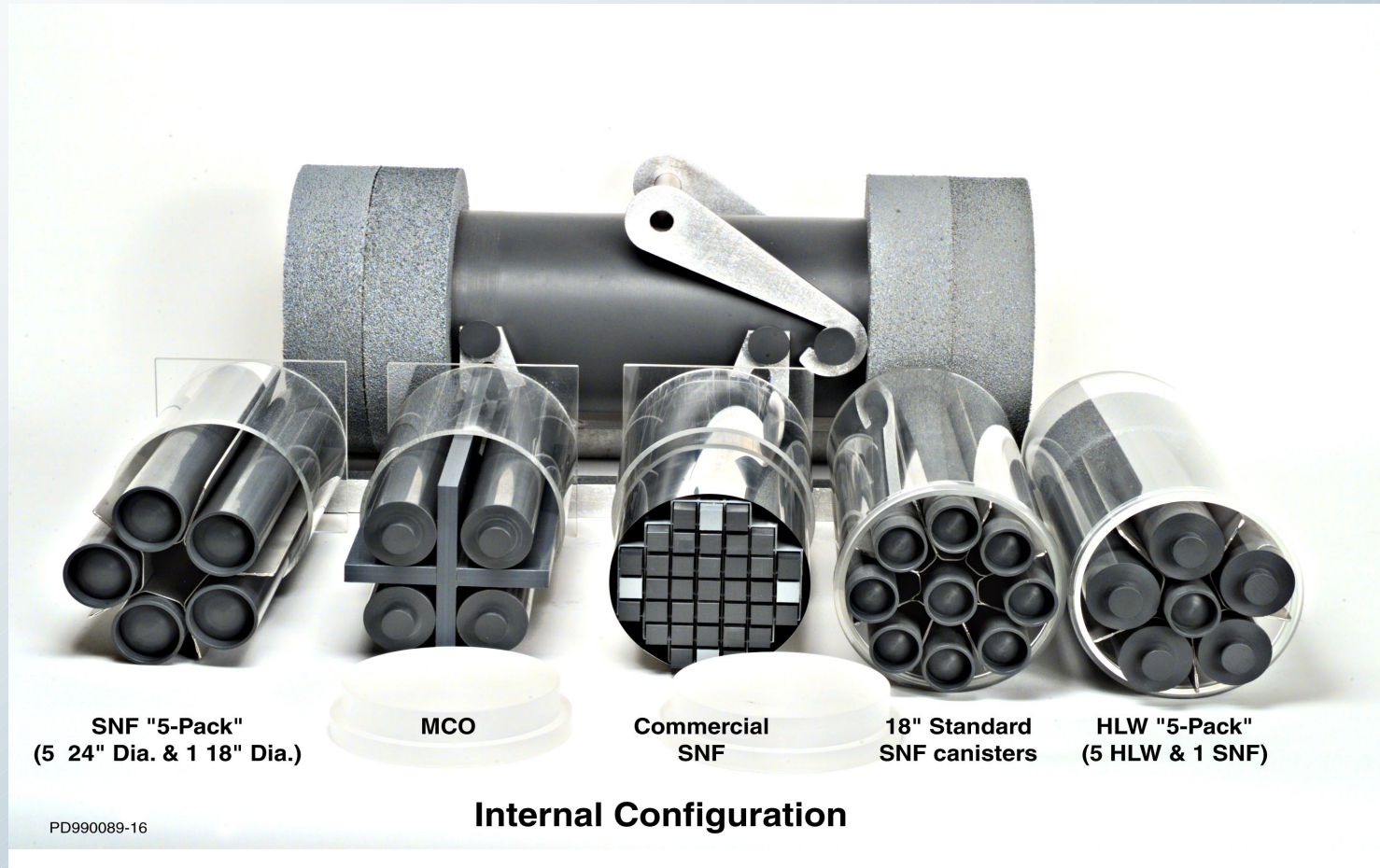
- Required use of casks with NRC certificates (10 CFR 71)
- Based design on repository waste disposal container dimensions
- Performed site transportation capabilities and preparedness assessment
- Performed preconceptual design studies

Transportation Cask System



- Designing a cask to transport all DOE SNF
 - Type B cask per 10 CFR 71
- Developing a highly versatile cask system
 - DOE-owned SNF
 - Standardized canister
 - MCO
 - DOE-commercial SNF
 - Compatible with HLW canisters

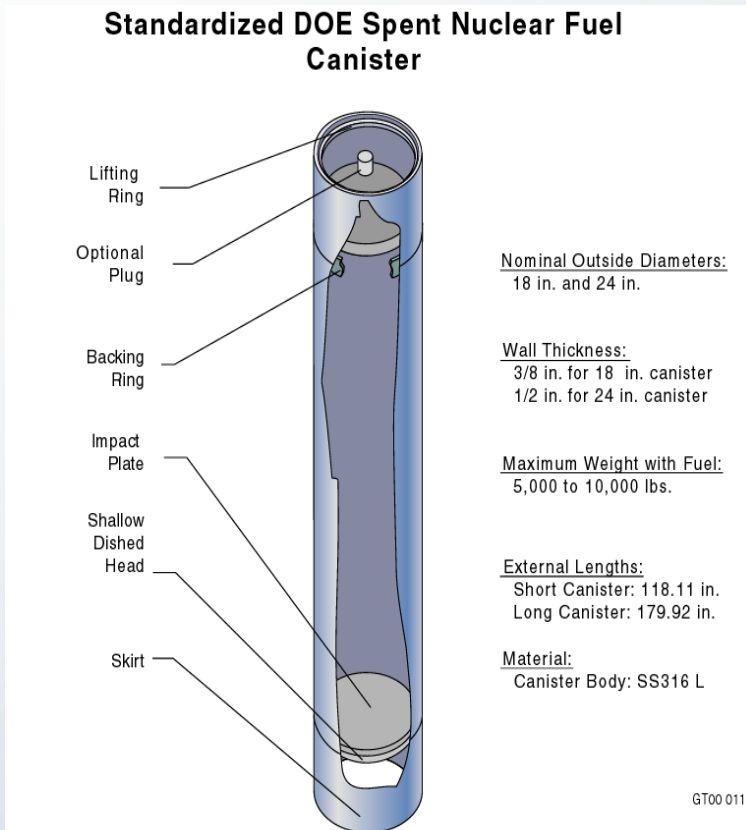
Transportation System Configurations



Transportation Packages

- Standardized canisters
 - 18 in. x 10 ft Lg
 - 18 in. x 15 ft Lg
 - 24 in. x 10 ft Lg
 - 24 in. x 15 ft Lg
- MCO
- Bare commercial fuel
- Damaged commercial fuel

Standardized DOE SNF Canister



- Developed to be single package used by DOE Complex
- Robust performance
- Maintains containment under accident conditions
 - New canister testing completed
 - Future aged/degraded canister testing
- Full scale testing and validation of analytical models
- Compatible with storage, transportation and disposal plans

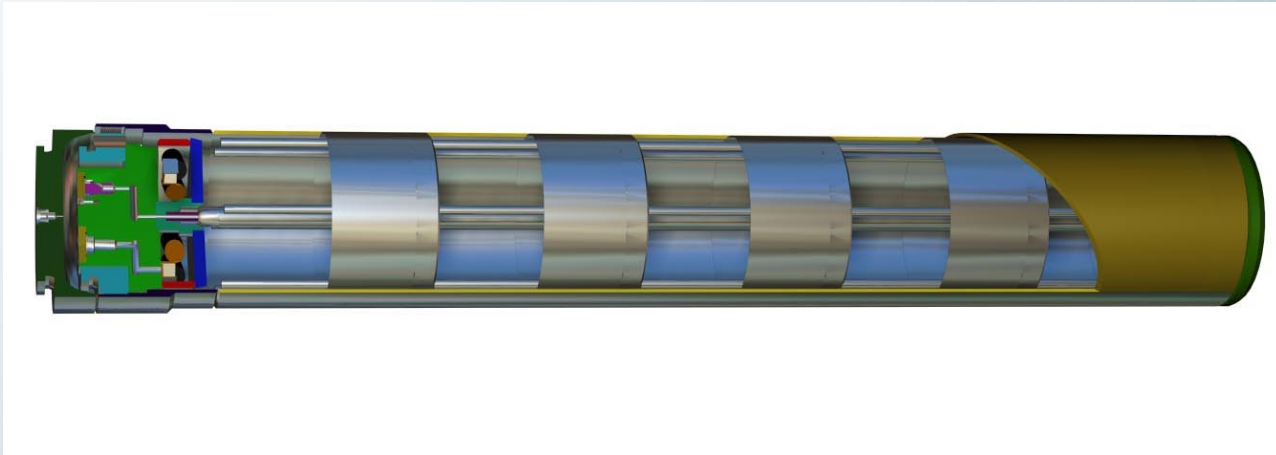
Status of ASME Code Changes

Change	Reason	Passed NUPACK	Current Status
Allow Field Operations	Final closure weld can be made at the loading site.	Yes Revised Subsection WA	Issued July 2001 (typo being corrected)
Alternate Stamping Requirements	N-stamp is valid after acceptance of final closure weld.	Yes Revised Subsection WA	Issued July 2001
Allow Ultrasonic Testing for Weld Examination	UT instead of radiography can be used for final closure weld examinations.	Yes Revised WB-5279	Issued July 2001
Allow Leak Testing in Lieu of Pressure Testing	Option of helium leak testing can be used.	Yes but held by NUPACK Chair to coordinate with new Subsection WC	Expedite new Division 3 Code Case, before main committee



*Multi-
Canister
Overpack*

MCO Cutaway



MCO Baskets



MCO Transporter



Transportation System Interfaces

- Repository interfaces defined in WASRD and Integrated Interface Control Document
- Idaho privatized dry storage facility contract has defined transportation interfaces
- Hanford and SRS load out facilities not started

Transportation System Envelope

	NSNFP Cask	WASRD	ID Contract
Diameter (w/IL)	132 in.	144 in.	128 in.
Length (w/IL)	287 in.	340 in.	308 in.
Dia. (A/Trun)	105 in.	108 in.	Not Spec.
Dia. (cask)	88 in.	100 in.	Not Spec.
Length (w/o IL)	228 in.	234 in.	Not Spec.
Weight (w/car)	200 T	263 T	200 T
Weight (Load)	147 T	200 T	150 T
Crane Limit		200 T	150 T

Potential Rail Casks Evaluated

*125 B ***

*HI-Star**

*MP-187**

NAC-STC

*NAC-UMS**

NSNFP TS

*TN-32***

TN-68

*TN-BRP***

TN-REG

** Not viable because companion canister is an integral part of the design.*

***Not viable because of size inefficiency.*

Potential Viable Rail Casks

- *15 ft Canisters (9 pack SNF), MCO (4 pack)*
 - *NSNFP TS*
- *15 ft Canisters (5 pack HLW +1 SNF), MCO*
(2 MCO + 2 HLW)
 - *NSNFP TS*

Potential Viable Rail Casks

- *10 ft Canisters (9 pack SNF)*
 - *TN-REG*
 - *NSNFP TS*
- *10 ft Canisters (5 pack HLW +1 SNF)*
 - *NAC-STC*
 - *TN-68*
 - *TN-REG*
 - *NSNFP TS*

Integrated Acceptance Schedule

Shipping

		FY	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
SNF	Size (ft)																											
ID	10													0			18	81	27	27	72	72	72	90	90	90	99	99
	15 x 18"													0	63	36	36	30	25	0	0	0	0	0	0	0	0	0
	15 x 24"													0		10	20		0	0	0	0	0	0	0	0	0	0
RL	15												0	0	0	0	0	0	0	0	0	0	0	0	14	29	43	43
	MCO													0										0	0	0	0	0
SRS	10												0		3	6	9	11	14	17	17	17	17	17	17	17	17	17
Navy	DPC												0		3	3	6	6	12	14	14	14	14	14	14	14	14	14
Totals															69	55	89	128	78	58	103	103	103	121	135	150	173	173
Cumulative Totals															69	124	212	341	419	477	580	683	786	907	1042	1192	1365	1538

Generation

		FY	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
SNF	Size (ft)																											
ID	10				0				0				15		0	41	54	54	54	54	63	63	70	72	72	72	81	72
	15 x 18"				0				36	81	49	12		0	0	15	15	15	15	17	17	17	15	17	17	17	17	17
	15 x 24"				0				0			30		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RL	15													0	0	0	0	0	0	0	0	0	0	0	58	58	58	58
	MCO				29	59	88	88	88	88				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SRS	10					0								0	30	50	50	50	50	25	25	25	5	5	5	5	5	5
Totals					29	59	88	88	124	169	49	42	15	0	30	106	119	119	119	96	105	105	90	94	152	152	161	152

MGR

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Shipments (casks)													11	9	16	20	20	19	24	24	24	26	28	30	32	32

Transportation Issues

- Site assessments performed in 1999, including site visits, documented
- Site load-out facilities not designed
 - Design to common cask configuration?
 - Design for co-shipment with HLW?
- Cask maintenance requirements?
- Multiple casks configuration and tooling

Remaining Transportation Activities

- Define EM transportation requirements and submit to RW
- Support RW transportation procurement activities, ensuring EM interfaces are maintained
- Provide interface between EM sites and RW transportation activities